

PATENT ABSTRACTS OF JAPAN

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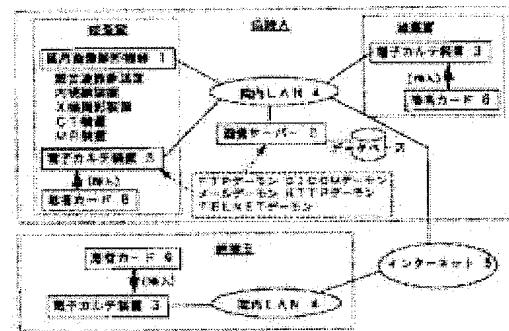
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(54) ELECTRONIC CLINICAL RECORDING SYSTEM

(57)Abstract:

PROBLEM TO BE SOLVED: To efficiently improve the precision of diagnosis by providing an information system which records medical treatment information at the time of medical treatment in a patient card which functions as a clinical recording and an individual holds with a portable recording medium and can refer to past record even in other hospitals later.

SOLUTION: In a hospital A a medical image diagnosis unit 1, an image server 2 and two electronic clinical recording devices 3, and in a hospital B the device 3 are connected to LANs in the respective hospitals. LAN 4 of the hospitals A and B are connected by the Internet 5. The respective devices 3 operate when the patient cards 6 as the clinical recordings, which the patients themselves have, are inserted. The server 2 and the device 3 of the hospital A transmit data in accordance with a request from the device 3 of the hospital B. A picture which the diagnosis unit 1 takes is transferred to the server 2 through a network or MOD and a magneto-optical disk. Thus, basic information and the past consultation history of the patient are referred to and the precision of diagnosis and the quality of medical treatment can efficiently be improved.



CLAIMS

[Claim(s)]

[Claim 1] A portable storage which memorizes information including a patient's medical records in a suitable electronic chart system for a wide area type medical information system, A writing means which writes in a patient's medical records described by this storage by SGML/eta TML, The link information conversion / creating means which changes or generates link information for referring to a specific file group of the medical records concerned as external information when writing medical records in patient cards by this writing means in the medical records concerned, A reading means which reads medical records currently written in said storage, An electronic chart system provided with the remote data acquisition / reference means which acquires or refers to said specific file group of the exterior described by said link information when reading medical records by this reading means.

[Claim 2] The electronic chart system according to claim 1 in which said storage is an IC card.

[Claim 3] A decision means said link information conversion / creating means judge size of size of said specific file group to be, The electronic chart system according to claim 1 or 2 provided with a determination means to decide whether save said specific file group in said storage according to a decision result of this decision means, or save outside.

[Claim 4] The electronic chart system according to claim 1 or 2 provided with a determination means to decide whether said link information conversion / creating means save said specific file group in said storage according to a decision result of a decision means which judges classification of said specific file group, and this decision means, or it saves outside.

[Claim 5] Said link information conversion / creating means including a means to change said link information dynamically to a SGML/eta TML file group which constitutes said medical records by this, The electronic chart system according to any one of claims 1 to 4 it is made to change said specific file group to which said remote data acquisition / reference means which accesses said specific file group change or, which is accessed by said remote data acquisition / reference means.

[Claim 6] Said remote data acquisition / reference means FTrho (File TransferProtocol), DICOM (Digital Imaging & Communicationin Medicine: medical picture telecommunications standard), An E-mail (UUCP, SMTP:Simple Mail Transfer Protocol), etaTTrho (Hyper Text TransferProtocol), The electronic chart system according to any one of claims 1 to 5 which is a means to use one protocol of the TELNET, or a protocol of arbitrary combination of them, and to acquire or refer to said external specific file group.

[Claim 7] The electronic chart system according to any one of claims 1 to 6 provided with either [at least] the data encryption / decoding means which enciphers / decrypts data of said file, or the data compressions/decompression means which compress / thaw data of said file.

[Claim 8] The electronic chart system according to any one of claims 1 to 7 which is provided with an operator specifying means which specifies an operator who operates this electronic chart system, limits classification of information which can access medical records according to an

operator's qualification, and was made to perform a security management.

[Claim 9] A data graph-ized means to graph-ize physical checkup data of the medical records of a patient who incorporated into this electronic chart system, and body data to a time series, The electronic chart system according to any one of claims 1 to 8 provided with an output means which outputs as a graph data graph-ized by this data graph-ized means.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the medical information system which uses the portable memory storage represented by the IC card etc. as health, Medical Science Division, and a welfare card.

[0002]

[Description of the Prior Art] There is the following as an example which used the card type storage medium for the medical information system.

[0003][1] As an example which introduced the IC card into health, Medical Science Division, and a welfare field, there is an experiment project of some local self-governing bodies. In this example, a name, an address, a health insurance card sign number, a blood group, a medicine side-effects history, allergy, dosing information, medical checkup information, etc. were stored in the IC card, and it uses in the cases, such as health consultation, a vaccination, an institution medical checkup. The same trial is performed also in some another self-governing bodies. In the case of a certain self-governing body of these, the information on medicinal data, a name, a blood group, etc. prescribed for the patient is stored in an IC card as a result of an inspection or a medical examination, and diagnosis in the medical institution which is not on-line-sized, and when a unforeseen accident happens, it is profiting. The role of an IC card is auxiliary, connects a hospital and a clinic with an online network to a health center, and is sharing the data of an inspection or a medical examination between this example. In the case of another self-governing body, the basic information on an individual name, an address, etc. is begun to an IC card, and physical checkup data, physical conditions, the Assessment on Search Report by Designated Searching Authority of welfare facilities, etc. are accumulated. There is also an experiment of iotaC card system which has a function of an insurance card as another example.

[0004][2] As an example using an optical card, the contents of the maternity record book are recorded, growth curves, such as a femur of the weight of a gravida, protein in urine, height of uterine fundus, the fetal head biparietal diameter, and an embryo, are displayed in a graph one by one, and the system which can grasp the state of a gravida and an embryo's growth easily is developed. When the weight of a gravida increases too much, this system is sufficient and a problem arises to an embryo growth pattern, the color on a screen changes and attention is called.

[0005] There are the following in the technology of transmitting medical imaging from a viewpoint of PACS (Picture Archiving & Communication System).

[0006][3] The place which rhoACS means the medical imaging comprehensive management

system in the hospital which keeps medical imaging, searches, and transmits and displays, and is made into the purpose is in the increase in efficiency of medical examination and the medical quality improvement by electronic preservation of medical imaging. About transmission of medical imaging, the standard protocol for transmission of medical imaging called DICOM (Digital Imaging & Communication in Medicine) has spread widely. Based on the form for carrying out electronic preservation of medical imaging called IS&C (ImageSave & Carry), medical imaging is recorded on off-line media (magneto-optical disc), and there is also a method of carrying medical imaging. The teleradiology system (Teleradiology System) extended that range for this rhoACS as application of the area or telemedicine. In a teleradiology system, medical imaging information is transmitted using a dial-up line or an ISDN circuit, and it also enables the diagnosis which that I have the result which the specialist diagnosed returned takes emergency to treat appropriately and promptly.

[0007]The following are among the typical technology which carries out mutual use of the medical-examination data among hospitals.

[0008][4] Connect between two or more specific hospitals with a telephone line, build the system as for which - ***** carries out all the patients' medical information and medical imaging information, and enable it to refer to a patient's medical information from each hospital (for example, a medical information management system: refer to JP,7-311807,A).

[0009][5] Medical information and medical imaging information are stored in the database, and it can suit with reference to a mutual database by SQL (Structured Query Language). However, there was some grammatical difference depending on a database, and the relation as Client-Server was comparatively close, and there was restraint by that with some. The restrictions by flooding of a file format and the difference in OS (Operating System), etc. exist also not about database reference but about exchange of a mere file.

[0010]On the other hand, there is the following technology from a viewpoint of an electronic chart system.

[0011][6] In the electronic chart system to which development is advanced at a certain university, the electronic chart was expressed in the SGML/eta[TML]-like language, batch management was carried out in the medical-application database, and search and a display are realized using the structure of WWW (World Wide Web). In this example, an electronic chart is regarded as a structured document and it mounts by expressing that structure and a rough semantic unit with a tag.

[0012]

[Problem to be solved by the invention]In the present medical information system, it is going to cross-reference medical information under this premise on the assumption that batch management of the clinical recording is carried out in a hospital, but there are the following problems by such a system.

[0013]** The protocol of information transmission is fixed and the addition of a clinical recording entry, etc. are difficult.

** Discovering required information out of huge information takes time and effort. Since search

certainly occurs, it may become the hindrance of medical examination.

** Even if it acts as an intermediary also of a present mass magnetic disk drive and optical-magnetic disc equipment (autochanger), no medical information and medical picture information of patients can be saved forever. For this reason, all data is not necessarily in an always accessible state.

** All the medical-examination organization does not have the same hardware environment. Considerable cost is required to prepare equipments required in order to be able to refer to a clinical recording from other medical-examination organizations, and it is almost actually difficult.

** With reference to an examination image rather than is [which has been referred to in the form which relates an examination image, medical examination information, and biological information with a clinical recording] independently important from a viewpoint of the medical progression in quality. However, in rhoACS, the framework which treats medical information as multimedia data is not provided.

** In the card type storage medium, the storage capacity was comparatively small and the use was limited. The clinical recording stood on the premise of existing in a hospital.

[0014]Thus, it was difficult to materialize the wide area type hospital information system through networks, such as the Internet, in the conventional system.

[0015]While this invention is made in view of this present condition and solving the capacity problem of portable recording equipment, It sets it as the main purpose to provide the electronic chart system for the wide area type hospital information system which can share medical examination information between an overall community, without being conscious of the difference in a model or OS by low cost.

[0016]The thing for which it enables it to refer to consultation / medication record with the patient's various clinical recording and other medical-examination organizations as a-like secondary purpose of this invention at the time of patient medical examination, A picture with enabling it to observe together from a clinical recording, and reproducing individual basic information, allergy information, etc. It is attaining at least one of enabling it to save labor clinical recording preparing work and enabling-it [display the data in medical records graphically and / to explain it plainly for a patient] **.

[0017]

[Means for solving problem]In order to solve an aforementioned problem, the summary of this invention is as follows. An individual keeps the portable storage operated as a clinical recording as health, Medical Science Division, and a welfare card (it is called patient cards), and when undergoing medical examination in a medical-examination organization, the patient cards are shown. In a medical-examination organization, medical examination information is recorded on patient cards. Even when a patient carries out to other medical-examination organizations, it is considered as the wide area type hospital information system that the past medical records are acquired distantly and can be referred to in the medical-examination organization. Therefore, a SGML/eta TML file and a data file describe medical records including an examination report, examination image information, medical examination information, biological information, etc. After

changing or generating link information so that those file groups may be referred to as external information without saving a specific file group in patient cards, when saving the medical records at patient cards, medical records are saved at patient cards. When reading and displaying medical records from patient cards, a file content can be referred to according to link information, or a file is acquired and it enables it to display a file content as medical records that it is together or separately on the other hand.

[0018]The portable storage which memorizes the information which this invention is a suitable electronic chart system for a wide area type medical information system, and specifically includes a patient's medical records, The writing means which writes in a patient's medical records described by this storage by SGML/eta TML, When writing medical records in patient cards by this writing means, in order to refer to the specific file group of the medical records concerned as external information, it is characterized by an electronic chart system comprising the following. The link information conversion / creating means which changes or generates link information in the medical records concerned

The reading means which reads the medical records currently written in said storage.

The remote data acquisition / reference means which acquires or refers to said specific file group of the exterior described by said link information when reading medical records by this reading means

[0019]Said storage is an IC card, for example.

[0020]A means to compress / extract the file saved at patient cards, and the means enciphered / decrypted are formed, the load to a network may be reduced or the safety of the data which flows on a network may be secured.

[0021]It has an operator specifying means, the classification of the information which can access medical records according to an operator's qualification is limited, and it may enable it to perform a security management. It has a means to graph-ize a patient's physical checkup data and body data which were incorporated into the electronic chart system, and may enable it to display change of a state as time series data.

[0022]The outline of an operation of this electronic chart system is as follows.

[0023]At the time of the first medical examination, first, patient basic information is read from patient cards by the reading means, and the form of medical records is created. At this time, a medical institution name, a generating date, and a medical-examination medical practitioner name are registered and displayed automatically. Then, the contents of a therapy are inputted, ordering an inspection, medication, etc. if needed or taking [a patient's chief complaint, observed physical findings, etc. are inputted, and] a measure.

[0024]If required, the list display of the result of the past medical records or a periodic medical examination will be carried out, and medical records and the periodic medical examination result which are likely to have relation will be chosen and displayed. When link information is pointing to external information in medical records at this time, it is accessed by remote data according to that link information, and data is acquired. There are protocols, such as FTP, DICOM, an E-mail,

etaTTrho, and TELNET, in concrete remote data acquisition / reference means. When data is compressed / enciphered, received data are processed by data defrosting / decoding means. And as soon as processing is completed, it is displayed as medical records that it is together or separately at any time. and a writing means -- medical records -- patient cards -- at any time -- or it is saved collectively. A SGML/eta TML editor is used for the input and edit of medical records. Even when only reference of medical records is performed, the operator (medical practitioner) name which became clear by the time of a reference day and an operator specifying means is automatically added and recorded by medical records. Thereby, accidents, such as disclosure of the personal information due to the fall of morals, can be prevented.

[0025]An examination report is inputted into medical records when the inspection by ultrasonic diagnostic equipment, an endoscope apparatus, CT device, chi line photographing instrument, an MR apparatus, etc. is conducted. Then, the information on medical imaging diagnosing apparatus that the photoed examination image is stored is inputted, and link information is generated by link information conversion / creating means so that the direct reference of the photoed medical imaging can be carried out from medical records. These medical records are broken and are saved at patient cards.

[0026]After printing the photoed medical imaging on a film, downloading it to a computer using a film digitizer and saving it at a file, Link information can be generated so that ***** and its file may be accessed to link information conversion / creating means as external information, medical records can be broken, and it can also save at patient cards. A medical imaging file can be copied to patient cards, link information can be generated so that the file may be accessed, medical records can be broken, and it can also record on patient cards. Whether a medical imaging file is saved at patient cards, and is referred to or it is referred to as external information have a system decided with the size of a file, and a system decided by classification of a file. The operator (inspecting engineer) name which became clear using the time of a check date and an operator specifying means is automatically added and recorded by medical records.

[0027]An examination report is inputted into medical records when biological information is collected using a sphygmomanometer, an electrocardiograph, etc., After downloading data from a measuring machine machine to a computer through direct or a network and saving at a file, by link information conversion / creating means, link information is generated so that the file can be referred to from medical records, medical records are broken, and it is saved at patient cards. After downloading the data outputted to paper etc. to a computer from a measuring machine machine using an image scanner and saving at a file, Link information can be generated so that ***** and its file can be referred to for link information conversion / creating means from medical records, medical records can be broken, and it can also record on patient cards. A blood-pressure-data file and an electrocardio data-point file can be copied to patient cards, link information can be generated so that the file may be referred to from medical records, medical records can be broken, and it can also save at patient cards. Whether a biological information file is saved at patient cards, and is referred to or it is referred to as external information have a system decided with the size of a file, and a system decided by classification of a file. The

operator (nurse) name which became clear using the time of a check date and an operator specifying means is saved automatically at medical records.

[0028]At the time of re-examination, first, patient basic information is read from patient cards by the reading means, and the list display of the medical records is carried out. Selection of applicable record will display the last medical records. At this time, an updating date is recorded automatically. When medical-examination medical practitioner names differ, additional recording of the medical-examination medical practitioner name is carried out automatically. When link information is pointing to external reference, the file content which exists on other computers according to the link information is referred to, a file is acquired by remote data acquisition / reference means, and a file content is displayed that it is together or separately as medical records. There are FTrho, DICOM, an E-mail, etaTTP, TELNET, etc. in concrete remote data acquisition / reference means. Therefore, when it is not necessary to know how data is actually stored and receives on the computer, it is treated as a file. Data may be stored in a file, a database, a memory, etc. on other computers. When the acquired data is compressed / enciphered, it is displayed by a data compression / decompression means, and data encryption/decoding means after returning to the original data. And a medical practitioner judges various inspection results etc. synthetically, and inputs a view, the name of a disease, etc. and a writing means -- medical records -- patient cards -- at any time -- or it is saved collectively. A SGML/eta TML editor is used for the input and edit of medical records.

[0029]In order to explain medical records to a patient plainly, a data graph-ized means is used, and biological information, such as medical examination information and blood pressure, is changed and displayed on graph data. According to a patient's request, it can also output to a printer.

[0030]

[Mode for carrying out the invention]Next, one embodiment of this invention is described to attached Drawings based on an embodiment.

[0031]An outline of a wide area type hospital information system carrying an electronic chart system which applied this invention is shown in drawing 1.

[0032]A wide area type hospital information system shown in the figure is constituted between the hospital A and the hospital B. In one hospital A, the medical imaging diagnosing apparatus 1, the picture server 2, and two pieces of the electronic chart equipment 3 are connected to Local Area Network (LAN) 4 in the hospital. The electronic chart equipment 3 is connected to Local Area Network (LAN) 4 in the hospital in another hospital B, Local Area Network (LAN) 4 of the hospital A and the hospital B is connected to the Internet 5, respectively, and thereby, mutually, both Local Area Networks 4 are constituted so that communication is possible.

[0033]The medical imaging diagnosing apparatus 1 is ultrasonic diagnostic equipment, an endoscope apparatus, X-rays equipment, a CT device, an MR apparatus, etc. The picture server 2 is provided with the following.

It is a computer system which manages medical imaging information, and is recording equipment. The means of communication which makes data transfer possible through a network.

As recording equipment, MO (magneto-optical disc), a hard disk (etaDD), DVD (digital videodisc), PD (portable disk), etc. are used. The patient cards (health, Medical Science Division, and welfare card) 6 as a clinical recording which a patient individual owns are inserted, and the electronic chart equipment 3 operates.

[0034]On the picture server 2 and the electronic chart equipment 3 of the hospital A, In order to perform data communications according to the demand from the electronic chart equipment 3 of the hospital B, either or those combination of a FTP demon, a DICOM demon, an e-mail demon, etaTTP demon, and a TELNET demon are operating. The picture photoed with the medical imaging diagnosing apparatus 1 is transmitted to the picture server 2 via a network or off-line media (for example, MOD: magneto-optical disc).

[0035]Each composition of the electronic chart equipment 3 is typically shown in drawing 2. The electronic chart equipment 3 is the integral-type personal computer (a personal computer is called hereafter) to which two or more external instruments were connected. The types of this personal computer may be any of a tower configuration, a desktop type, a note type, or a workstation.

[0036]The electronic chart equipment 3 is provided with the display device 7, the input device 8 of text information, the pointing equipment 9, and the computer body 10.

[0037]The display device 7 displays the medical imaging information represented by Still Picture Sub-Division, video, and graphic information and the text information represented by a character and the sign. Although the display device 7 of the example of a figure has adopted the CRT display, a liquid crystal display panel and a television set may be used. As the input device 8, a character, a sign, and the keyboard in which the direct entry of programming data or the kana-kanji conversion of an input character is possible are applicable. As for the pointing equipment 9, a mouse, a trackball, a touch panel, and a tablet are applicable. The computer body 10 performs data processing, has CPU, a memory, and recording equipment 22 grade, and is constituted while carrying out generalization management of said device group. The recording equipment 22 is formed combining MO (magneto-optical disc), a hard disk (etaDD), DVD (digital videodisc), PD (portable disk), etc. two or more.

[0038]The external instrument control device 11 for controlling an external instrument is built into the electronic chart equipment 3. As an external instrument used as the controlled object of the computer body 10, The image information inputting device 12, the patient-cards input/output device 13 which constitutes a part of read-out / writing means of patient cards, the operator card input device 14 which forms a part of operator specifying means, the biological information input device 15, the printer 16, etc. are mentioned.

[0039]Among this, as the input device 12 of picture information, a video camera, a videotape recorder, Still Picture Sub-Division incorporation equipment, such as video incorporation equipment and moving-image-reproduction equipment, such as a laser disc, or a digital camera, an image scanner, and a film digitizer, is used combining an interface board corresponding to each apparatus. As the patient-cards input/output device 13, an IC card input/output device, an optical card input/output device, A magnetic card input/output device, a RAM card input/output

device, MO (magneto-optical disc) input/output device, MD (mini disc) input/output device, PD (portable disk) input/output device, A FUROBBI disk (FDD) input/output device, a cassette streamer, a DVD (digital videodisc) input/output device, a CD-R input/output device, etc. are used combining an interface board corresponding to each apparatus.

[0040]The operator card input device 14 is equipment for reading identification information of an operator card which specifies an operator. An operator card is given for those [every] who need to operate this electronic chart equipment 3, such as a medical practitioner, an inspecting engineer, and a nurse, and identification information, such as an individual's ID number, is memorized beforehand. The electronic chart equipment 3 is programmed not to operate, if an operator card is not first inserted in the operator card input device 14, and reservation of security is achieved. Contents which can process data of the electronic chart equipment 3 according to whether you are a medical practitioner or you are an inspecting engineer (an input, edit) were decided corresponding to an operator's qualification.

[0041]As the biological information input device 15, a sphygmomanometer, an electrocardiograph, a blood-oxygen-levels meter, etc. are used combining interface PODO corresponding to each apparatus. As the printer 16, an image printer and a PostScript printer are applicable.

[0042]The electronic chart equipment 3 contains each above-mentioned device group, and also is provided with the means of communication 17 which connects with a cable/wireless LAN, an ISDN circuit, an ordinary public circuit, a CATV circuit, a dedicated line, etc., and makes data transfer possible through a network.

[0043]The electronic chart equipment 3 is provided with various kinds of means functionally realized by execution of software to build in. Without saving a specific file group in patient cards as the means among a SGML/eta TML file which constitutes medical records, and various data files, The link information conversion / creating means 18 (refer to drawing 9 mentioned later) which changes or generates link information so that it may be considered as reference by making the specifying data into external information, If it is pointing to link information being external information when displaying medical-examination memory in patient cards, The remote data acquisition / reference means 19 (drawing 6, ten to 14 reference which are mentioned later) which acquires the file concerned according to the link information, The data encryption / decoding means 20 (drawing 6, nine references which are mentioned later) for making safer data which flows on a network, They are the data compression / decompression means 21 (drawing 6, nine references which are mentioned later) for reducing load to a network, the data graph-ized means 23 (refer to drawing 6 mentioned later) for carrying out graphical representation of the data so that physical checkup data and biological information can be explained plainly for a patient, etc.

[0044]The entry eye of medical records is constituted as shown in the following table.

[Table 1]

情報項目	内 容
基本情報	ID、氏名、住所、健康保険証記号番号、性別、生年月日、職業・習慣
救急情報	血液型、薬品副作用歴、アレルギー
家族歴情報	父母、兄弟姉妹などの病歴
診療記録	主訴、身体所見、症状・所見、病名、医療機関名、発生／更新年月日、医師名、診断結果（重要度、根拠）、問題リスト、各種検査結果、放射線レポート、紹介状、オーダー内容、治療計画と実施内容、投薬情報（処方日付、回数、薬品名、用法、1日あたりの数量、投薬量）等
検診情報	検診日、検診種別、各種検診データ

[0045]The information below minimum is indicated to link information. Link information is also changeable by conditions. For example, if it is before the date, link information A will be accessed, otherwise access will be told to link information B. The accessing means and address of link information are constituted as shown in the following tables.

[Table 2]

リンク情報項目	内 容
アクセス手段	FTP、DICOM、電子メール、HTTP、TELNET
アドレス	URLおよびポート番号、インターネットアドレス、ポート番号、およびパス名、メールアドレス。このアドレスには、ファイルのフォーマットを現す拡張子が必ず付加されているものとする。拡張子としては、GNUPLOT、JPEG、GIF、MPEG、PPM、AU、WAV、MJPEG等があり、これによってデータ受信後の処理が一意に決まる。

[0046]Drawing 3 and drawing 4 express the data structure of medical records. Medical records comprise a file of two or more plain texts described by SGML/eta TML, and a data file group which stored various data. That is, in etaTML, since the description for referring to an external file is supported, not only a character but a still picture, video, a sound, a figure, a table, etc. can be treated simultaneously, and multimedia information can completely be seen in a similar manner on various models/OS's using a WWW browser. It is also possible to download and perform the program written by the script language represented with a specific WWW browser by the program written by JAVA language, a VISUAL BASIC language, etc., JAVASCRIPT, etc. on a WWW browser.

[0047]In the example of mounting of the data structure of the medical records of drawing 3, 1 medical records are treated as one SGML/eta TML file, and one SGML/eta TML file for tables of contents which refers to each medical records is prepared. Refer to the data file of several different kinds for one medical-records file if needed. In the case of an IC card with a small storage capacity, etc., it is possible to save only this contents file in an IC card.

[0048]All the medical records are stored in one SGML/eta TML file in the example of mounting of

the data structure of the medical records of drawing 4.

[0049]Drawing 5 shows the example of the recording mode in the case of recording medical records on an IC card. Only a fixed-length file can be treated in an IC card. Then, it is vacant in an IC card and an area file is created, and when it is going to save the file beyond the size of the file set up beforehand, the data of a part which exceeded is automatically recorded on the empty area file. Therefore, one logical file may correspond to two or more physical files, and has managed by FAT (file access table) including the correspondence relation. In the case of an IC card, a data input/output is performed via a device driver for exclusive use.

[0050]On the other hand, in the case of CD-R, FDD, PD, MD, MOD, etc., it can be used by the DOS format etc. which are an ISO standard or a de facto standard format, and can also use for them as a file system. In these cases, a variable-length file can save as it is.

[0051]Although there are SIOC, DELA, an Olympus system, etc. about an optical card now, the data format used as an ISO standard is adopted. Also in the case of an optical card, it outputs and inputs via a device driver for exclusive use.

[0052]After starting, each of the electronic chart equipment 3 enters from a menu screen, and can perform processing given in an outline now to drawing 6 or drawing 7. Processing of drawing 6 is for a medical practitioner to input medical examination information into an electronic chart (patient cards 6), and it of drawing 7 is for an inspecting engineer and a nurse to input an examination report and biological information into an electronic chart (patient cards 6).

[0053]Processing of drawing 6 is explained first. The electronic chart equipment 3 reads the entry information of an operator card from the operator card input device 14, and checks an operator and its qualification (Step 101). The operator who has not registered beforehand is eliminated from operation by this check.

[0054]And based on the input from the input device 8 or 9, it is judged whether a medical examination is the first medical examination, it is re-examination, or it is reference of mere medical records (Steps 102 and 103). When it is judged by this judgment that the present medical examination is the first medical examination, it shifts to a series of processings of Steps 104–109, when it is judged that it is re-examination, it shifts to a series of processings of Steps 110–115, and when it is judged that it is reference, it shifts to a series of processings of Steps 116–120.

[0055]In the case of the first medical examination, selection of an input mode is carried out first and new production mode is set up (Step 104). Electronic chart equipment can choose three input modes, and can be made to display them on a separate window screen for every medical records if needed. Three modes are new production mode, addition mode, and reference mode. The details of this mode select are shown in the flow chart of drawing 8.

[0056]An operator chooses an input mode at Step 1001 of drawing 8, and, as for the electronic chart equipment 3, the input mode judges addition mode, new production mode, and reference mode at Steps 1002 and 1003. When it is addition mode, it is Step 1004 further and it is judged whether a medical institution name differs from the last thing. Even if it starts by addition mode by this, when medical institution names differ, it changes into reference mode automatically at Step 1005. When new production mode or addition mode is chosen, etaTML (Hyper Text Markup

Language) editor or/and SGML (Standard Generalize Markup Language) are started at Step 1006. When reference mode is chosen, the WWW (World Wide Web) browser which interprets a JAVA applet at Step 1007 is started.

[0057]After setting out in this new production mode finishes, the electronic chart equipment 3 reads and carries out the list display of description, such as basic information currently written in the patient cards 6 via the patient-cards input/output device 13 (drawing 6, Steps 105 and 106). Subsequently, the form of medical records is created at Step 107. Subsequently, the medical examination of a patient's chief complaint, the view of a medical examination, the name of a disease, an order, etc. and the information on treatment (medical examination information) are inputted via the text input equipment 8 or the pointing equipment 9 at Step 108.

[0058]External information can be acquired / referred to if necessity is during this input. When the link information which shows that it is external information is in medical records, the data acquisition/reference of this are done from remoteness (Steps 111–112: explain processing of this remote data acquisition in full detail by next drawing 10 – 14). Thawing treatment is carried out when decoding processing is carried out when the external data acquired from remoteness is enciphered, and/or compression processing is carried out at this time (Step 1113). Data (for example, biological information, such as blood pressure) predetermined [of the medical records] is graph-sized if needed, and processing displayed or printed on a monitor is also carried out (Steps 1114 and 1115).

[0059]After the above processing finishes, medical records are written in and saved via the patient-cards input/output device 13 at the patient cards 6 (Step 109).

[0060]On the other hand, in re-examination, sequential execution of the processing of Steps 110–115 of drawing 6 is carried out. The electronic chart equipment 3 chooses an input mode like the above-mentioned, and sets up addition mode (Step 110). Subsequently, after performing read-out of description of patient cards, and its list display (Steps 111 and 112), the medical records of the last medical examination are displayed (Step 113), medical examination information is inputted (Step 114), and the medical records broken further are written in patient cards, and are saved (Step 115).

[0061]When processing of Step 113 is performed, an updating date is recorded automatically and medical examination medical practitioner names differ, additional recording also of the medical examination medical practitioner name is carried out automatically (Step 1116). In addition, although not illustrated, also when only reference of medical records is performed and there is no addition of data, in this addition mode, information is automatically recorded for a referencing person name, a reference medical institution name, etc. at the time of that reference day.

[0062]When it has intention of reference from the beginning, processing of Steps 116–120 is performed. That is, the electronic chart equipment 3 chooses an input mode (reference mode) (Step 116), reads description of the patient cards 6 (Step 117), and carries out the list display of the medical records (Step 118). Refer for this. With this reference, at the time of a reference day, an operator name is recorded automatically and those medical records are saved at the patient cards 6 (Steps 119 and 120).

[0063]Then, the processing which inputs the examination report and biological information of drawing 7 is explained. The electronic chart equipment 3 checks an operator first (drawing 7, Step 131). Usually, in the case of the examination report of medical imaging etc., an operator is limited to an inspecting engineer and, in the case of the biological information of blood pressure, electrocardiogram data, etc., an operator is limited to a nurse. If an operator can check, the electronic chart equipment 3 will choose an input mode like the above-mentioned. In this case, it is set as addition mode (Step 132).

[0064]Subsequently, description of the patient cards 6 is read and the list display of the medical records is carried out (Steps 133 and 134). Subsequently, for example, based on the operation information from the pointing equipment 9, the inspection items (for example, an MR examination, a blood-pressure inspection, etc.) which add data are chosen (Step 135).

[0065]Then, an examination report or biological information is inputted (Step 136), and that input is given to processing of link information conversion / generation (Step 137). Processing of this link information conversion / generation is later mentioned with reference to drawing 9. And the medical records which added an examination report and biological information in this way are again written in the patient cards 6, and are saved (Step 138). At the time of this preservation, the time of a check date and an operator name are also saved automatically.

[0066]Then, the algorithm of processing of the link information conversion / generation given in drawing 9 performed by the electronic chart equipment 3 is explained generally. If this processing starts, the electronic chart equipment 3 will input the attribute (for example, are they image data **** and text data?) of data first (Step 140). Subsequently, it is judged whether it is inputting data (Step 141). When inputting data, the electronic chart equipment 3 chooses a device, reads the data, and saves it at a file (Steps 142–144). If it is necessary to compress this data, compression processing will be performed (Steps 145 and 146), and encryption processing will be performed if it is necessary to encipher that data (Steps 147 and 148).

[0067]Subsequently, the system which discriminates from whether the electronic chart equipment 3 carries out external preservation of the specific file is chosen (Step 149). As this system, two kinds of the classification of a file size and a file are prepared here. Then, it judges whether a file size is larger than prescribed size (Step 150), and/or it is judged whether the classification of a file is image data (Step 151).

[0068]By these judging processes, a file size is small, and/or when it is determined that file data is not image data, processing which copies the file to the patient cards 6 is carried out (Step 151). A file size is large, and/or when it is determined that file data is image data, processing which copies the file to external instruments, such as the external picture server 2, is carried out (Step 152).

[0069]When it can judge that NO, i.e., data, does not input by processing of Step 141 mentioned above on the other hand, processing of these steps 142–152 is skipped.

[0070]Subsequently, it is judged whether the electronic chart equipment 3 has a conditional sentence for changing link information dynamically (Step 154). When there is this conditional sentence, applet generation processing and HTML sentence generation processing are performed

one by one (Steps 155 and 156), and when there is no such conditional sentence on the other hand, only HTML sentence generation processing is performed (Step 157). Link information is changed / generated by HTML sentence generation processing.

[0071] Processing of remote data acquisition is explained. Drawing 10 – 14 show the example of mounting of remote data acquisition / reference means 19, respectively.

[0072] Drawing 10 shows the system outline in the case of using FTP as a protocol for exchanging data. In the electronic chart equipment of the hospital B, the case where consultation record in the hospital A is displayed is explained to an example. The link information which showed that the examination image was stored in the picture server of the hospital A shall be described as follows by medical records.

[0073]

[External character 1]

検査: MR検査

[0074] If the place of an "MR examination" is clicked by a mouse button on a WWW browser, a WWW browser will require establishment of FTrho connection of the picture server of the hospital A. An INET demon starts FTrho demon and a picture server establishes a communication connection. Next, the USER command and the PASS command are transmitted and a login procedure is performed. And after transmitting the BINARY command and changing transfer mode, I transmit a GET command and have a "images/slicel.jpeg" file transmitted. Finally the QUIT command is transmitted and a connection is opened. Since the received extension of a file name expresses a picture, an image viewer is started and the contents of the file are displayed. It enables this to refer to the examination image on the picture server of the hospital A.

[0075] Drawing 11 shows the system outline in the case of using etaTTrho as a protocol for exchanging data. In the electronic chart equipment of the hospital B, the case where consultation record in the hospital A is displayed is explained to an example. The link information which showed that the examination image was stored in the picture server of the hospital A shall be described as follows by medical records.

[0076]

[External character 2]

検査:

[0077] If it is going to display these medical records on a WWW browser, WWW PURAUZA will require establishment of etaTTP connection of the picture server of the hospital A. The etaTTrho demon who is operating on a picture server establishes a communication connection according to a demand. Next, the transfer request of a "images/slicel.jpeg" file is performed and the connection after the completion of transmission is opened. Since the received extension of a file

name expresses a picture, the picture is displayed in the page as which the medical records of the WWW browser are displayed. As a result, it becomes possible to refer to the examination image on the picture server of the hospital A.

[0078] Drawing 12 shows a system outline in a case of using an E-mail as a protocol for exchanging data. In electronic chart equipment of the hospital B, a case where consultation record in the hospital A is displayed is explained to an example. Link information which showed that an examination image was stored in a picture server of the hospital A shall be described as follows by medical records.

[0079]

[External character 3]

<code>検査:MR検査</code>
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[0080] On a WWW browser, if a place of an "MR examination" is clicked by a mouse button, from a WWW browser, a "images/slicel.jpeg" file will create wording of a telegram of a purport needed to an address of "operator@hospitcal-A.co.jp", and will transmit to it. An E-mail which reached a picture server of the hospital A, It is detected from a CRON demon by the program which checks arrival of an E-mail started periodically, and the contents of e-mail are analyzed, a binary / thing which carried out text conversion is added to response mail, and a "images/slicel.jpeg" file is transmitted. Also in electronic chart equipment, since detect an E-mail which arrived similarly, the contents of e-mail are analyzed, a text / binary conversion is performed and it expresses that an extension of a file is a picture, an image viewer is started and the examination image is displayed. It enables this to refer to an examination image on a picture server of the hospital A.

[0081] Drawing 13 shows a system outline in a case of using DICOM as a protocol for exchanging data. In electronic chart equipment of the hospital B, a case where consultation record in the hospital A is displayed is explained to an example. Link information which showed that an examination image was stored in a picture server of the hospital A shall be described as follows by medical records.

[0082]

[External character 4]

<code>検査: MR検査</code>

[0083] If a place of an "MR examination" is clicked by a mouse button on a WWW browser, a WWW browser will require establishment of an etaTTrho connection of a picture server of the hospital A. An etaTTrho demon who is operating on a picture server establishes a communication connection according to a demand. And while receiving a "bin/dicom.html" file, a class file group of a JAVA applet which this file is referring to is received, and a communication connection is opened. This JAVA applet has a DICOM client function and image display functions. In a "dicom.html" file, an Internet address of a connection destination computer, a port number, and information that

identifies a file to transmit are described using rhoARAM tag. On a WWW browser, when displaying the etaTML file, interpretation execution is carried out and a JAVA applet gives a connection demand to a DICOM demon who is operating on a picture server of the hospital A. A DICOM demon establishes a communication connection according to the demand. And a specified picture is received and a communication connection is opened. A JAVA applet draws a received picture to a page as which medical records are displayed. It enables this to refer to an examination image on a picture server of the hospital A.

[0084] Drawing 14 shows the system outline in the case of using TELNET as a protocol for referring to data. In the electronic chart equipment of the hospital B, the case where consultation record in the hospital A is displayed is explained to an example. The link information which showed that blood pressure data was stored in the picture server of the hospital A shall be described as follows by medical records.

[0085]

[External character 5]

検査: 血圧データ

[0086] If the place of "blood pressure data" is clicked by a mouse button on a WWW browser, a WWW browser will require establishment of an etaTTrho connection of the picture server of the hospital A. The etaTTrho demon who is operating on a picture server establishes a communication connection according to a demand. And while receiving a "bin/telnet.html" file, the class file group of the JAVA applet which this file is referring to is received, and a communication connection is opened. This JAVA applet has a TELNET client function. In the "telnet.html" file, the command name for referring to the Internet address of a connection destination computer, a login name, a password, and data and the file name to refer to are described using rhoARAM tag. On a WWW browser, when displaying the etaTML file, interpretation execution is carried out and a JAVA applet gives a connection demand to the TELNET demon who is operating on the picture server of the hospital A. A TELNET demon establishes a communication connection according to a demand. And the USER command and rhoASS command are transmitted and a login procedure is performed. Then, the command which refers to a designated file is executed and an executed result is displayed on the page as which medical records are displayed. And in response to a user's terminating request, the QUIT command is transmitted and a communication connection is opened. It enables this to refer to the blood pressure data on the picture server of the hospital A.

[0087] The technique of processing of the data encryption/decoding which is during various kinds of processings mentioned above, and is carried out if needed, processing of a data compression/defrosting, and processing the formation of a data graph is explained.

[0088] Various techniques including DES (Data Encryption Standard) which is the technique of the symmetrical key cryptosystem most widely used for processing of data encryption/decoding are available. For example, in using the software of PGP (Pretty Good Privacy) as encryption/a

decoding means, it exchanges each one of public keys mutually among the users who exchange data first. And encryption processing is performed using its public key information to the file to transmit. The extension "FILENAME.pgp" is added to the enciphered file. ***** decoding processing is performed for the public key information which uses the enciphered file at the time of encryption when a network is acquired as a medium.

[0089]To processing of a data compression/defrosting, a ZIP system / COMPRESS system / GZIP system / rhoACK system is available. For example, when a COMPRESS system is used, the extension "FILENAME.Z" is added to the compressed file. In this case, the "compress" command is used at the time of compression, and the "uncompress" command is used at the time of defrosting.

[0090]In processing of formation of a data graph, a specified keyword in medical records is detected first, a data file corresponding to those keywords is read, and it data-izes to a time series. For example, etaTML sentence with the word a "inspection" and "blood pressure data" is extracted, and while detecting the time of a file name currently referred to in the etaTML sentence, and a check date, data stored in the file is read and it rearranges in order of the date. Next, a two-dimensional graph is created from the date and blood pressure data, and it displays on a screen. By visualizing change of a living body's condition can explain a curative effect and a situation plainly for a patient.

[0091]An operator of this electronic chart system 3 is registered beforehand. There is a system which enters a login name and a password, a system which makes an operator card read, a system which inputs a fingerprint, or a system which photos and specifies an operator's face with a camera etc. in this operator's specification. According to this embodiment, a system which makes an operator card read is used.

[0092]Order is explained for a role of electronic chart equipment in a wide area type hospital information system shown in drawing 1 later on.

[0093](1) In the consultation room of the hospital A, a medical practitioner starts the electronic chart equipment 3 first, inserts an operator card in the operator card input device 14 of an operator specifying means, and registers an operator. When examining a patient, it changes into the state which has inserted in the patient-cards input/output device 13 the patient cards 6 which a patient owns, the contents of patient cards are read, and the list display of the past medical records is performed. When a patient is the first medical examination, "new production mode" is chosen and the form of medical records is created based on the basic information on patient cards. At this time, a medical institution name, a generating date, and a medical-examination medical practitioner name are registered and displayed automatically.

[0094]Then, a medical practitioner inputs a patient's chief complaint, observed physical findings, etc., and he inputs the contents of a therapy, ordering an inspection, medication, etc. if needed or performing required treatment. passing a patient-cards input/output device at the time of the end of a medical examination -- medical records -- patient cards -- at any time -- or it saves collectively.

[0095](2) In the laboratory of the hospital A, when the inspection by the medical imaging

diagnosing apparatus 1 is carried out, the photoed picture is transmitted to the picture server 2 via of the House LAN4 from the medical imaging diagnosing apparatus 1, and is managed with the picture server 2.

[0096](3) An inspecting engineer starts the electronic chart equipment 3 of a laboratory, inserts an operator card in the operator card input device 14 of an operator specifying means, and registers an operator. It changes into the state which has inserted in the patient-cards input/output device 13 the patient cards 6 which a patient owns after inspection finish, the contents of patient cards are read, the list display of medical records is performed, medical records with a test request are chosen, and "addition mode" is set up. And the examination report carried out in the item of the contents of a therapy is inputted.

[0097]Then, an examination image is registered into medical records according to the algorithm of the link information conversion / creating means shown in drawing 9. Since the image data itself is stored in the picture server 2 in now, Choose "he has no data input" and picture iotaD for identifying the Internet address of the picture server 2, a port number, an access method, and the photoed picture, etc. are inputted, The link information which can refer to the examination image on the picture server 2 from medical records is generated, and medical records are broken.

[0098]The link information used by conditions is also changeable. For example, if an examination image will be acquired using etaTTP if it is less than 30 days, and it consists of check dates after it, it will be said that an examination image is acquired using an E-mail. This is the restrictions by the storage capacity of a picture server, and when exchangeable recording equipments, such as MOD and DVD, are used, it is in the situation generated well. In this case, those with a condition are chosen in link information conversion / creating means, If conditions and the link information for which it substitutes were inputted, after the program written in the JAVA language will be generated and being changed into a pseudo code, etaTML file which constitutes medical records so that the program may be called is changed or generated. Thereby, it becomes possible to change link information by conditions.

[0099]If registration of an examination report is completed, the broken medical records will be saved at the patient cards 6, and patient cards will be taken out. When saving at patient cards, the operator (inspecting engineer) name which became clear using the time of a check date and the operator specifying means 14 is saved automatically at medical records.

[0100](4) In the medical imaging diagnosing apparatus 1, after printing the photoed medical imaging on a film and downloading it to a computer, saving at patient cards is also possible. In drawing 9 explaining the outline of the algorithm of link information conversion / creating means, Selection "with data input" is made first, a film digitizer is chosen from the devices of the image information inputting device 14, the film is set to a digitizer, and it reads into the electronic chart equipment 3, and saves at a file. Next, in compressing the data file, it performs compression processing using compression/decompression means. In enciphering, it performs encryption processing using encryption/decoding means. At this time, the extension is added to the file name so that – mind may understand the turn of processing required to return to the original data file, and processing. Next, link information is changed or generated so that the data file can be

referred to from medical records, and medical records are broken.

[0101]About whether link information is generated so that it may be referred to from medical records as external information without copying the data file in the patient cards 6 and copying whether link information which refers to it is generated, and its data file in patient cards, two systems are selectable. One is a system decided by size of a file, and another is a system decided by classification of a file. As mentioned above, it is also possible to change link information used by conditions. If registration of an examination report is completed, broken medical records will be saved at the patient cards 6, and patient cards will be taken out. When saving at patient cards, an operator (inspecting engineer) name which became clear using the time of a check date and an operator specifying means is saved automatically at medical records.

[0102](5) When biological information is collected using the biological information input devices 15, such as a sphygmomanometer and an electrocardiograph, After inputting an examination report into medical records, incorporating data into the electronic chart equipment 3 from a measuring machine machine through direct or a network and saving at a file, link information which refers to the file from medical records is generated using link information conversion / creating means, and medical records are broken.

[0103]A measuring result is directly outputted to paper etc. from the biological information input device 15, After incorporating it into electronic chart equipment using an image scanner which is one of the image information inputting devices 12 and saving at a file, link information which refers to the file can be generated, and medical records can also be broken.

[0104]About whether link information is generated so that it may be referred to from medical records as external information without copying the data file in patient cards and copying whether link information which refers to it is generated, and its data file in patient cards, two systems are selectable. One is a system decided by size of a file, and another is a system decided by classification of a file. As mentioned above, it is also possible to change the link information used by conditions. If registration of an examination report is completed, the broken medical records will be saved at the patient cards 6, and patient cards will be taken out. The operator (nurse) name which became clear using the time of a check date and an operator specifying means is saved automatically at medical records.

[0105](6) If patient basic information is read from patient cards, the list display of the medical records is carried out and the record concerned is first chosen by a reading means at the time of re-examination, the last medical records will be displayed. At this time, an updating date is recorded automatically. When medical-examination medical practitioner names differ, additional recording also of the medical-examination medical practitioner name is carried out automatically. Even when it does not input only by reference, a referencing person name and a reference medical-examination organization name are automatically recorded at the time of a reference day. Thereby, disclosure of the personal information due to a morals fall and the effect which deters generating of ***** when are expectable. When displaying selected medical records and link information is pointing to external reference, by remote data acquisition / reference means, the link information is followed, it refers to or acquires and a file is displayed. It is not necessary to

know how the file is actually stored. Although it may be stored in a file, a database, a memory, etc., when the substance of a file receives the data, it becomes identifiable as a file.

[0106]There are protocols, such as FTP, DICOM, an E-mail, etaTTrho, and TELNET, in concrete remote data acquisition / reference means. When a file which received is enciphered, decoding processing is performed using encryption/decoding means. When a file which received is compressed, thawing treatment is performed using compression/decompression means. And as soon as processing is completed, a file content is displayed as medical records that it is together or separately. A medical practitioner judges various inspection results etc. synthetically, and inputs a view, the name of a disease, etc. and -- using a patient-cards writing means -- medical records -- patient cards -- at any time -- or it saves collectively.

[0107]etaTML editor is used for an input and edit of medical records. If required, the list display of the result of the past medical records or a periodic medical examination will be carried out, and medical records and a periodic medical examination result which are likely to have relation will be chosen and displayed. When link information is pointing to external reference in medical records at this time, a file is referred to by a method mentioned above using remote data acquisition / reference means, or it can acquire and a file content can be made to display it as medical records that it is together or separately.

[0108](7) In order to explain medical records to a patient plainly, a means to graph-ize data is used, treat biological information, such as medical examination information and blood pressure, as time series data, and it is also possible to carry out graphical representation. It is also possible to print on paper a screen currently outputted to the display device 7 with the printer 16 as it is according to a patient's request. Thereby, a patient becomes possible [considering carefully contents which were not fully able to be understood at a house etc. by a medical practitioner's explanation].

[0109]Although the case where a wide area type medical information system was applied to the system currently built between two hospitals was shown, the electronic chart system of an embodiment mentioned above can apply the electronic chart system of this invention similarly, even if a hospital is a wide area type medical information system or more over three.

[0110]

[Effect of the Invention]The effect of this invention is as follows.

[0111]** Since basic information, such as a blood group and allergy information, the past consultation history, etc. can be referred to when the case where it goes to medical institutions other than family, an accident, and an unexpected disaster are encountered, contribute to improvement in the accuracy of the diagnosis.

** An examination image can be referred to simultaneously and it can be made to contribute to the medical progression in quality by comparing with it and a past picture.

** The work which clinical recording creation takes can be reduced and it can treat efficiently.

** The data in medical records is displayed graphically and can be explained now plainly for a patient. Informed consent is supportable. As an effect of the system which is saved at the storage which can carry a clinical recording and a patient individual manages, the following is

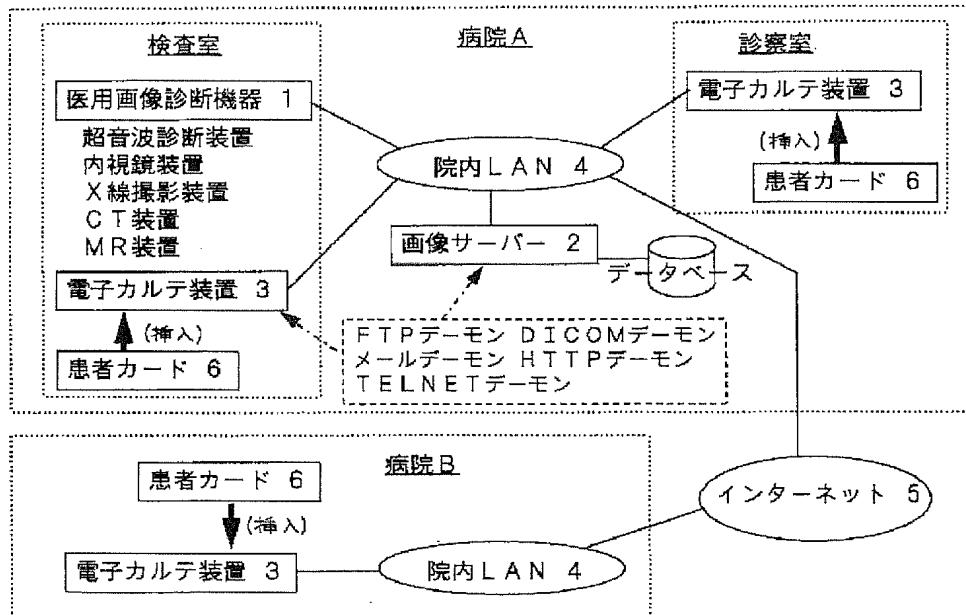
raised from a viewpoint of a wide area type hospital information system.

** Since the location of concrete data is described in patient cards when other medical institutions have data, the time which search takes can be saved. It can be managed even if an operator does not necessarily learn the method of data transfer, and the part and operation become easy, and an operational labor is also lightened.

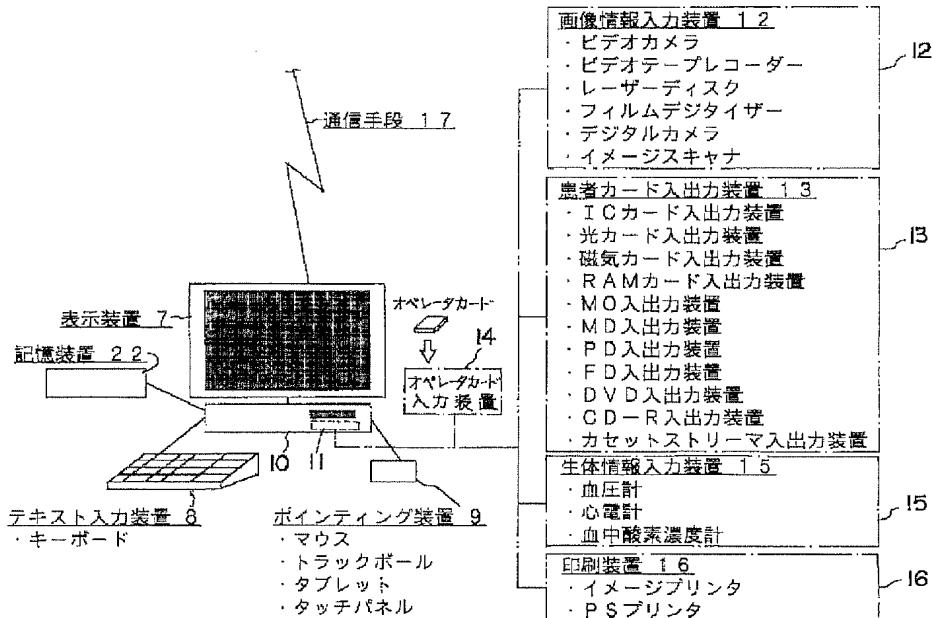
** Since data transmission systems and the access method of data can be chosen according to the actual condition of a medical institution, it is rich in pliability and, moreover, a wide area type hospital information system can be built by low cost.

DRAWINGS

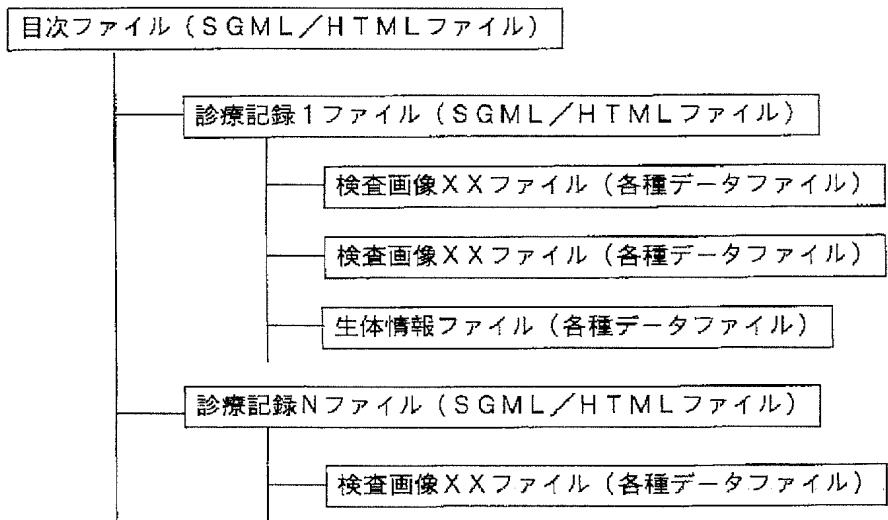
[Drawing 1]



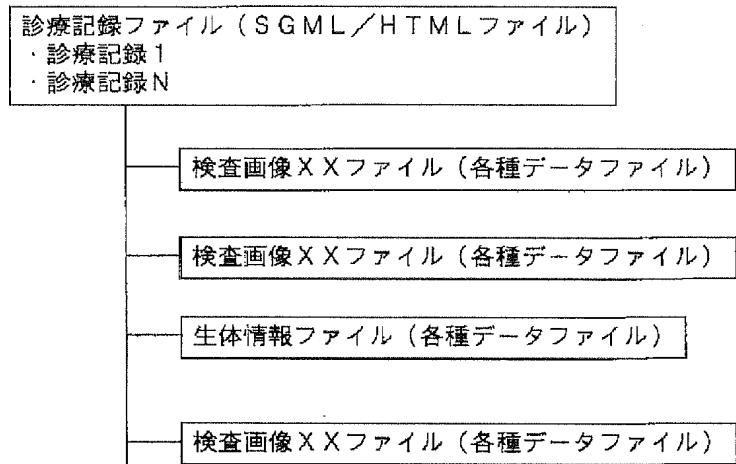
[Drawing 2]



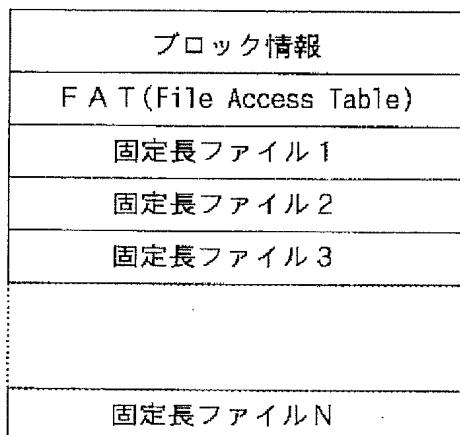
[Drawing 3]

診療記録のデータ構造の実装例 1

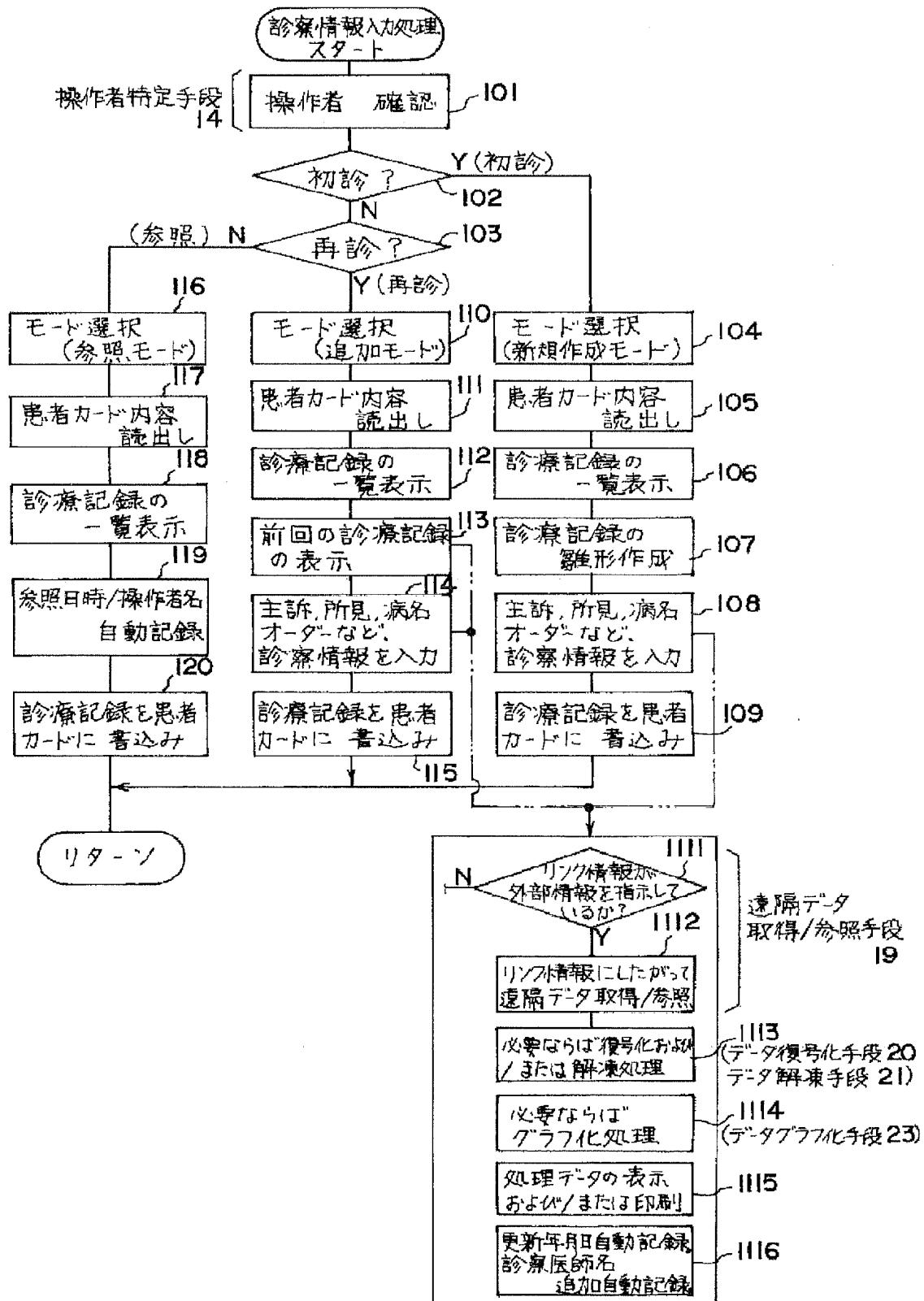
[Drawing 4]

診療記録のデータ構造の実装例 2

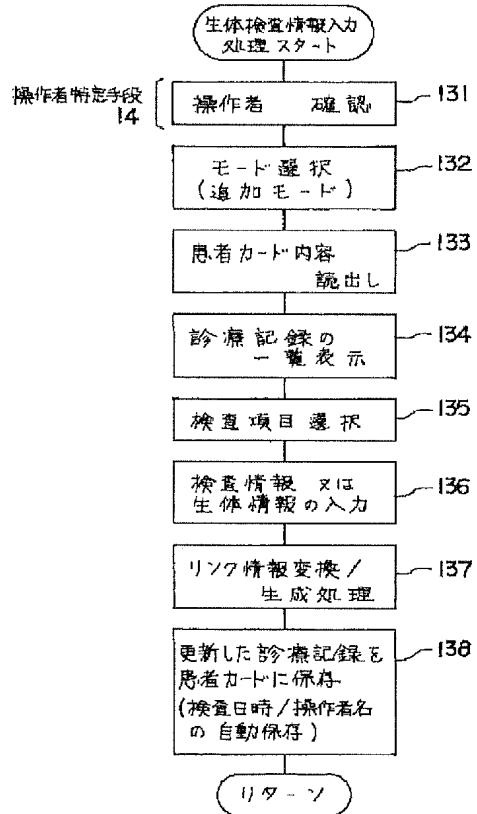
[Drawing 5]

ICカードにデータを格納する場合の構造

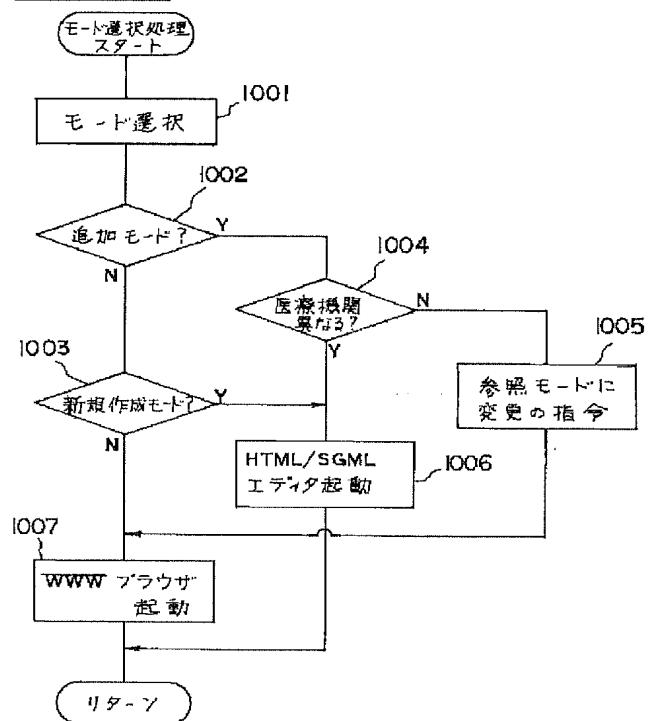
[Drawing 6]



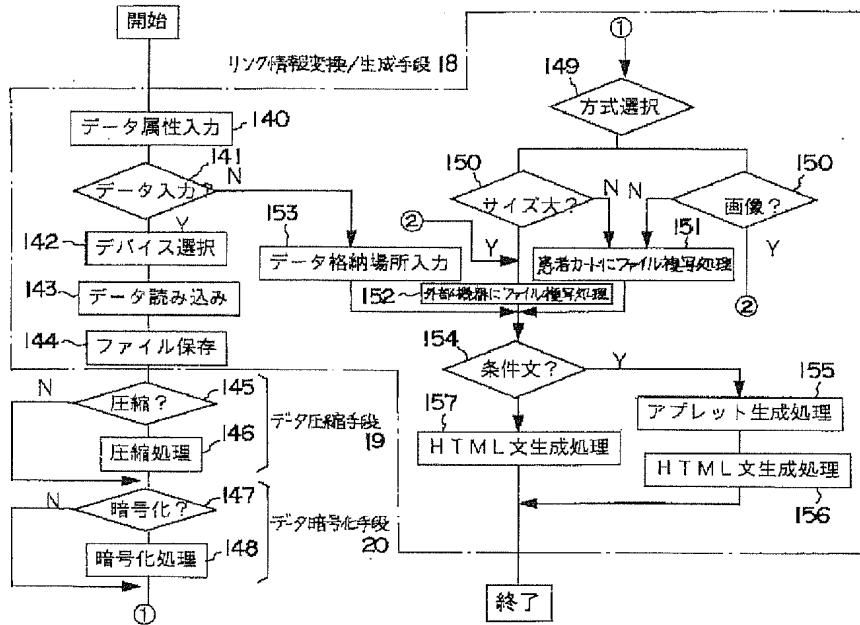
[Drawing 7]



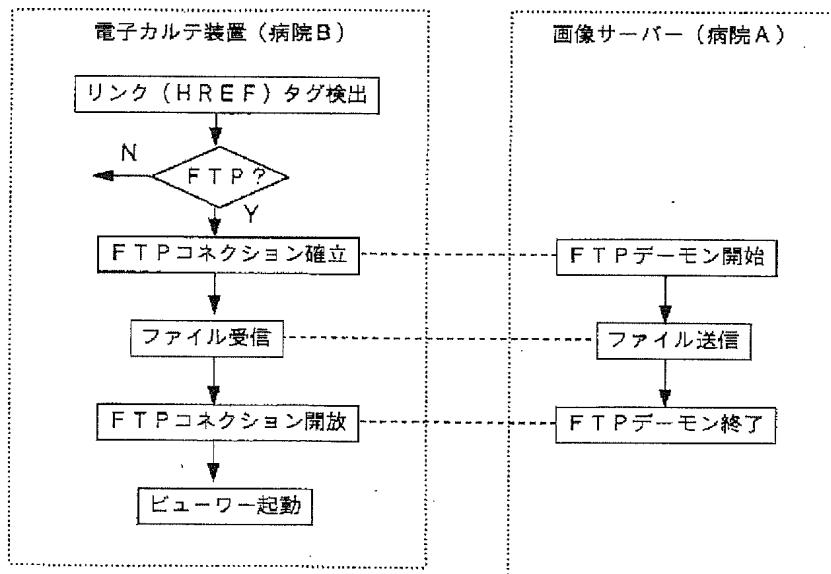
[Drawing 8]



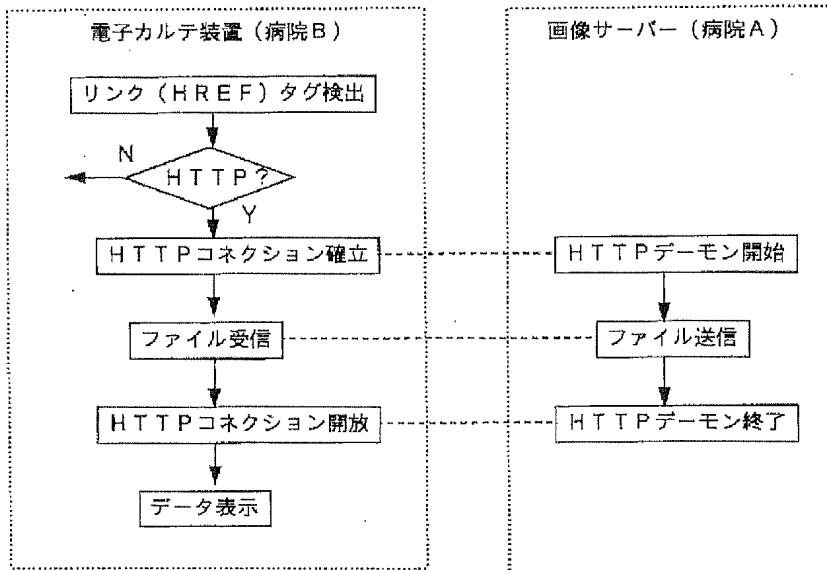
[Drawing 9]



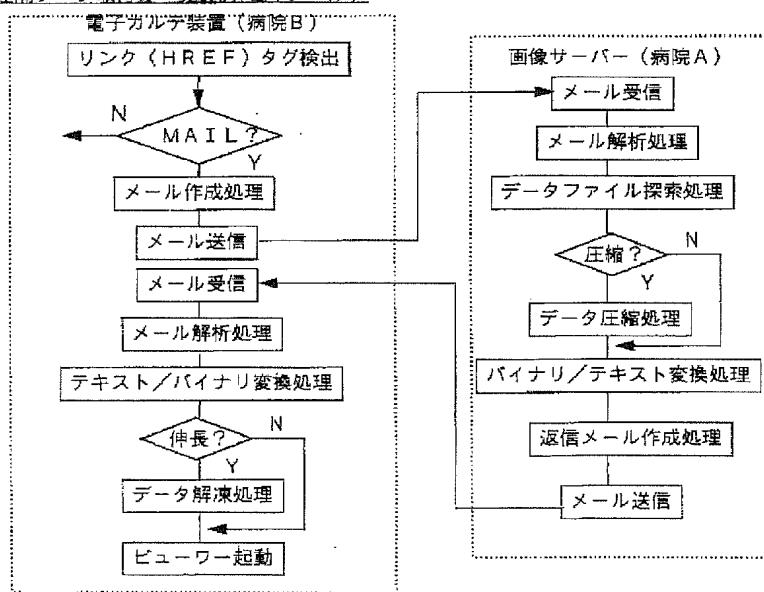
[Drawing 10]

遠隔データ取得の一実装例（FTP）

[Drawing 11]

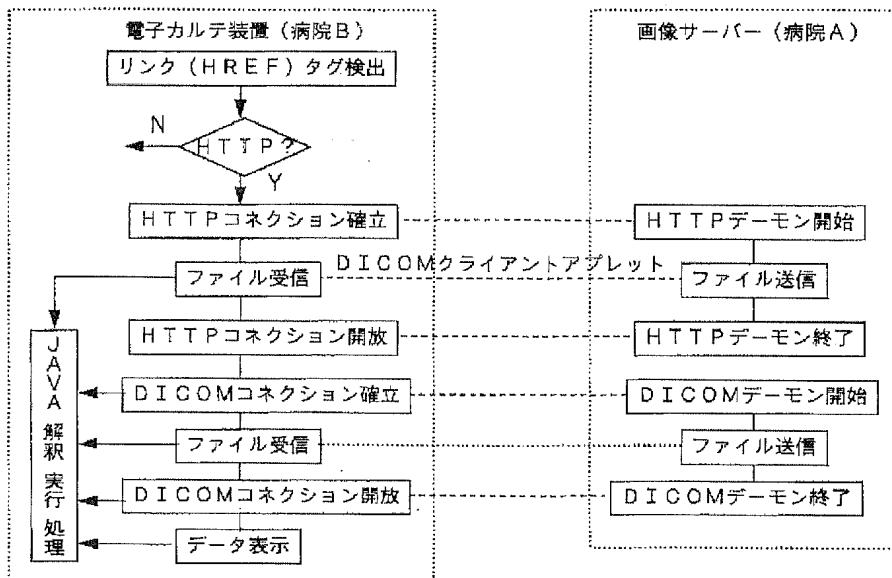
遠隔データ取得の一実験例（H T T P）

[Drawing 12]

遠隔データ取得の一実験例（電子メール）

[Drawing 13]

遠隔データ取得の一実装例（DICOM）



[Drawing 14]

遠隔データ参照の一実装例（TELNET）

